



The Meyer Sound UPA-2C is a compact, high-Q arrayable loudspeaker designed to perform in a variety of sound reinforcement applications. It is a bi-amplified system consisting of a proprietary 12-inch low-frequency cone driver in a vented enclosure with a 60-degree high-frequency horn and driver.

The UPA-2C is designed to be operated as a system with the Meyer Sound M-1A Control Electronics Unit (one M-1A per channel). The M-1A comprises electronic crossover, Meyer Sound exclusive SpeakerSense™ driver protection circuitry, and amplitude and phase response alignment circuitry optimized for the loudspeaker.

### Amplifier Requirements

The UPA-2C requires a professional quality two-channel power amplifier rated at 350 watts per channel continuous into 8 ohms. (If two UPA-1Cs are to be operated in parallel from the amplifier, it should be capable of driving 4 ohms.) Amplifiers of lower power will not allow the full power and headroom of the UPA-2C system to be realized (though this may be acceptable in applications where high pressure

levels are not required). Conversely, amplifiers rated at significantly more than 350 watts per channel into 8ohms may endanger the loudspeaker, and **is not recommended**. For further information on power amplifiers, please refer to **Power Amplifier Criteria**, a Technical Note available from Meyer Sound.

### Connections

The UPA-2C is a biamplified system and **must** be used with the **M-1A Control Electronics Unit**. The M-1A functions as an active crossover, dividing the input signal into high- and low-frequency components.

The connection terminals of the low- and high-frequency drivers appear on a single P-type 4-pin connector located on the rear of the UPA-2C cabinet. The pin assignments for this connector are:

- Pin 1 – 12-inch driver, hot
- Pin 2 – 12-inch driver, common
- Pin 3 – horn driver, common
- Pin 4 – horn driver, hot

(When the cabinet is fitted with an EP-5 connector, Pin 5 is unconnected.)

The minimum wire size for connections between the UPA-2C and the power amplifier should be 14 gauge.

**Note:** If you are using standard Meyer Sound loudspeaker cables and adapters, simply connect the female end of the loudspeaker cable to the UPA-2C, the male end of the cable to the Meyer Sound pigtail adapter, and the banana connectors of the adapter to your amplifier outputs. In making connections between the UPA-2C and the amplifier, be sure to connect the 12-inch driver to the **Lo** channel, and the horn driver to the **Hi** channel.

The adapter banana plugs are color-coded as follows:

- Red** – Low frequency driver
- Black** – High frequency driver

For connections between the M-1A and the power amplifier, refer to the **M-1A Operating Instructions**

### Verifying Polarity

All Meyer Sound loudspeakers are thoroughly tested in all stages of manufacture, and correct polarity of individual cabinets is assured. However, accidental polarity reversal is possible when there are multiple amplifier connections. A single cabinet which is out of phase with the rest of the system will cause severe cancellation, resulting in a noticeable decrease in SPL and possible component damage.

The “phase-popper” type of speaker phase checkers cannot reliably be used to test for correct polarity of the low and high drivers of the UPA-2C. However, because the UPA-2C is phase-corrected through crossover, Meyer Sound’s SIM® System II or many of the portable spectrum analyzers can be used, with a pink noise source, to test for driver polarity as follows:

#### 1. Single cabinets

First, verify polarity of the woofer by connecting a 9 volt battery at the end of the loudspeaker cable.

| EP Connector | Battery    |
|--------------|------------|
| Pin 1        | +terminal  |
| Pin 2        | - terminal |

- The woofer cone should move outward. Connect the speaker cable to the amplifier.
- Input the pink noise source to the M-1A and advance the M-1A Level control to a convenient measuring level.
- Standing in front of the loudspeaker, position the analyzer microphone directly between the horn and the 12-inch driver, at right angles to the cabinet face, and about 20 inches in front of the UPA-2C.

- If the polarity of the horn driver is reversed, a trough will appear in the response curve, centered near 1600Hz. If in doubt, reverse the polarity of the **Hi** amplifier output while you watch the analyzer display.

#### 2. Multiple cabinet arrays

Each cabinet should first be tested as above.

- Connect **one** loudspeaker in the array and advance the pink noise to a convenient measuring level. Position the measuring microphone on the axis between the first loudspeaker and the cabinet adjacent to it, and about six feet distant. Note the frequency response and overall level.
- Leaving the first loudspeaker connected, connect the adjacent one and observe the analyzer display. The entire curve should jump up in level, indicating correct addition between the loudspeakers. A polarity reversal between the loudspeakers will show up as severe broadband cancellation.
- Similarly, connect the rest of the cabinets in the array one by one, looking for correct addition as each loudspeaker is connected. (It will be necessary to reposition the microphone.)

**Note:** A polarity reversal within the system can result in severe damage to the components. It is strongly recommended that polarity testing be done at low levels and with the appropriate equipment.

**Rigging** The UPA-2C loudspeaker has four steel rigging brackets internally mounted as an integral part of the cabinet design and the cabinet is supplied with either aircraft pan fittings (ring and stud) or  $\frac{3}{8}$ "-16 nut plates, according to user preference. A flat plate is supplied when no rigging hardware is specified. All three plate types are held in place by six phillips-head machine screws and can be interchanged at any time. The handles on the UPA-2C cabinet are provided for moving and carrying the loudspeaker and are **not** to be used for rigging purposes.

The rigging hardware is designed so that a single point can support the normal load for the cabinet. In the case of the UPA-2C with aircraft pan fittings, the recommended maximum load is 420 lbs (190 kg). This working load is one-fifth the cabinet breaking strength, which is the minimum load that the cabinet will withstand before failing. All load ratings are based on a straight tensile

pull. Load directions other than straight can result in a significant reduction in breaking strength.

All rigging load ratings are also specified for cabinets in new condition. Age, wear or damage to the product can greatly reduce its rating. Accordingly, all products should be inspected on a regular basis. Any worn, damaged or deformed rigging components should be immediately removed from service and replaced.

**All Meyer Sound products must be used in accordance with local, state, federal and industry regulations. It is the owner's and/or user's responsibility to evaluate the suitability of any rigging method and product for their particular application. All rigging should be done by competent professionals.**

**Placement and Arraying** The high frequency horn of the UPA-2C adds very well in the horizontal axis, and the apparent sources of both high and low frequencies in the UPA-2C are co-planar in terms of propagation. For these reasons, multiple loudspeakers may be built into an array which behaves acoustically as a section of a radiating spherical surface. Such arrays offer precisely controlled coverage and propagate coherent wavefronts, acting as a close approximation to a point source.

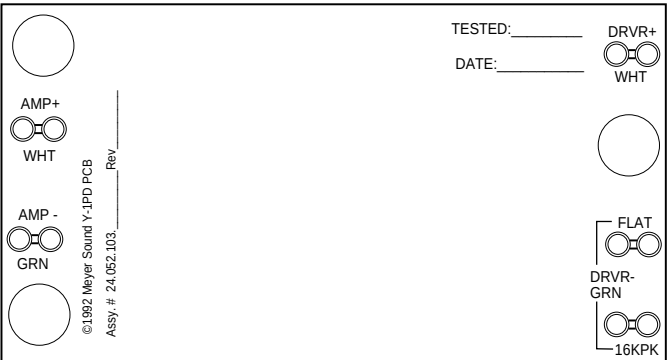
The UPA-2C is a high-Q loudspeaker, designed to provide precise coverage control and minimize unwanted reflections. Horizontal arrays should always be tight-packed (adjacent cabinet sides touching) to assure smooth transitions between units. When arraying units above one another to extend vertical coverage, make certain that each UPA-2C operates into its own coverage area with minimum overlap between units. Array performance is best verified and optimized with Meyer Sound's SIM System II.

**High Frequency Network** The UPA-2C loudspeaker contains, mounted in the enclosure, a DC protection and response correction network for the high-frequency horn driver. The network is mounted directly behind the MS-12 low-frequency cone driver on the inside rear face of the cabinet, and is wired in series with the horn driver.

The circuit board is fitted with five terminals, two of which (labeled AMP- and AMP+) are wired to the EP-4 connector pins 3 and 4. The other terminals (labeled FLAT and 16KPK), provide two options for tailoring the system's response. With the high driver common (green) wire connected to the FLAT terminal, the UPA-2C high-frequency response is nominally flat to 18 kHz. When the

common wire is connected to the 16KPK terminal, the UPA-2C exhibits a peaked response in the 16 kHz region. This response may be useful for overcoming propagation losses when far-field response is a dominant concern.

The UPA-2C is shipped with the high driver common connected for flat response. Should you desire more high-frequency energy, remove the six bolts holding the MS-12 in place, pull the MS-12 up and out of the cabinet, and move the green wire from the FLAT terminal to the 16KPK terminal. Be careful not to disturb the other wires to the network board or EP connector. When replacing the MS-12, be certain to tighten the six bolts evenly.



UPA-2C High Frequency Network Circuit Board



UPA-2C  
Loudspeaker

Operating Instructions

Specifications

Acoustical-UPA-2C/M-1A System

|                                                |                                                        |
|------------------------------------------------|--------------------------------------------------------|
| Frequency Response <sup>1</sup>                | 80 Hz to 18 kHz $\pm$ 4dB<br>-6 dB at 60 Hz and 20 kHz |
| Maximum SPL <sup>2</sup><br>Continuous<br>Peak | 125dB<br>132dB                                         |
| HF Coverage<br>Horizontal<br>Vertical          | 60 degrees<br>60 degrees                               |

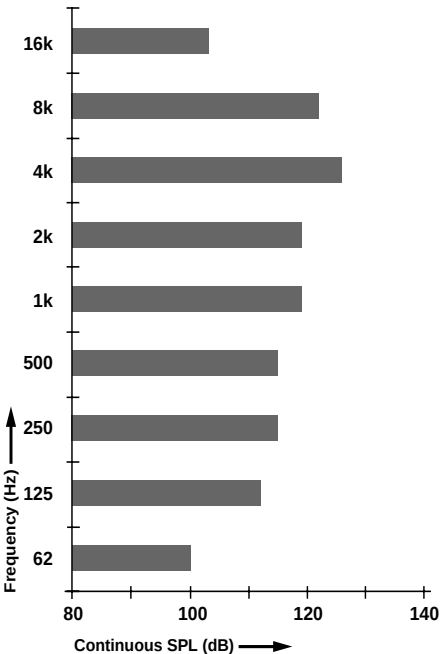
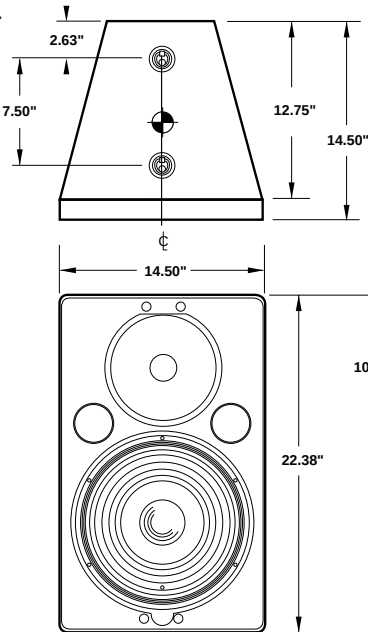
UPA-2C Loudspeaker

|                                                                    |                                                                       |
|--------------------------------------------------------------------|-----------------------------------------------------------------------|
| Driven Complement<br>Low Frequency Driver<br>High Frequency Driver | MS-12<br>MS-1401B                                                     |
| High Frequency Horn                                                | Constant-directivity                                                  |
| HF Network                                                         | Y-1PD                                                                 |
| Function                                                           | DC blocking and damped band-elimination filter                        |
| Enclosure                                                          | 0.8 cu. ft. vented, multi-ply<br>Finnish birch                        |
| Finish                                                             | Black textured, Weather protected optional                            |
| Physical Dimensions                                                | 14 1/2"W x 22 3/8"H x 14 1/2"D                                        |
| Weight                                                             | 67 lbs. (30 kg)                                                       |
| Protective Grill                                                   | Perforated steel screen, powder coated<br>charcoal-grey foam covering |
| Connector                                                          | EP-4 (male), EP-5 (male, Europe only)                                 |
| Rigging (optional)                                                 | Aircraft pan fittings, or 3/8"-16 or M10 x 1.5 nut plate              |

Note 1:  
Measured 1 meter from center of cabinet face, half-space conditions, pink noise input, HF network set to FLT, in one-third octave bands on ISO center frequencies. Low frequency response dependent on load conditions.

Note 2:  
Loudspeaker driven with 350 W/ ch. amplifier (8 ohm rating), pink noise input.

Physical Dimensions &  
Maximum SPL



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